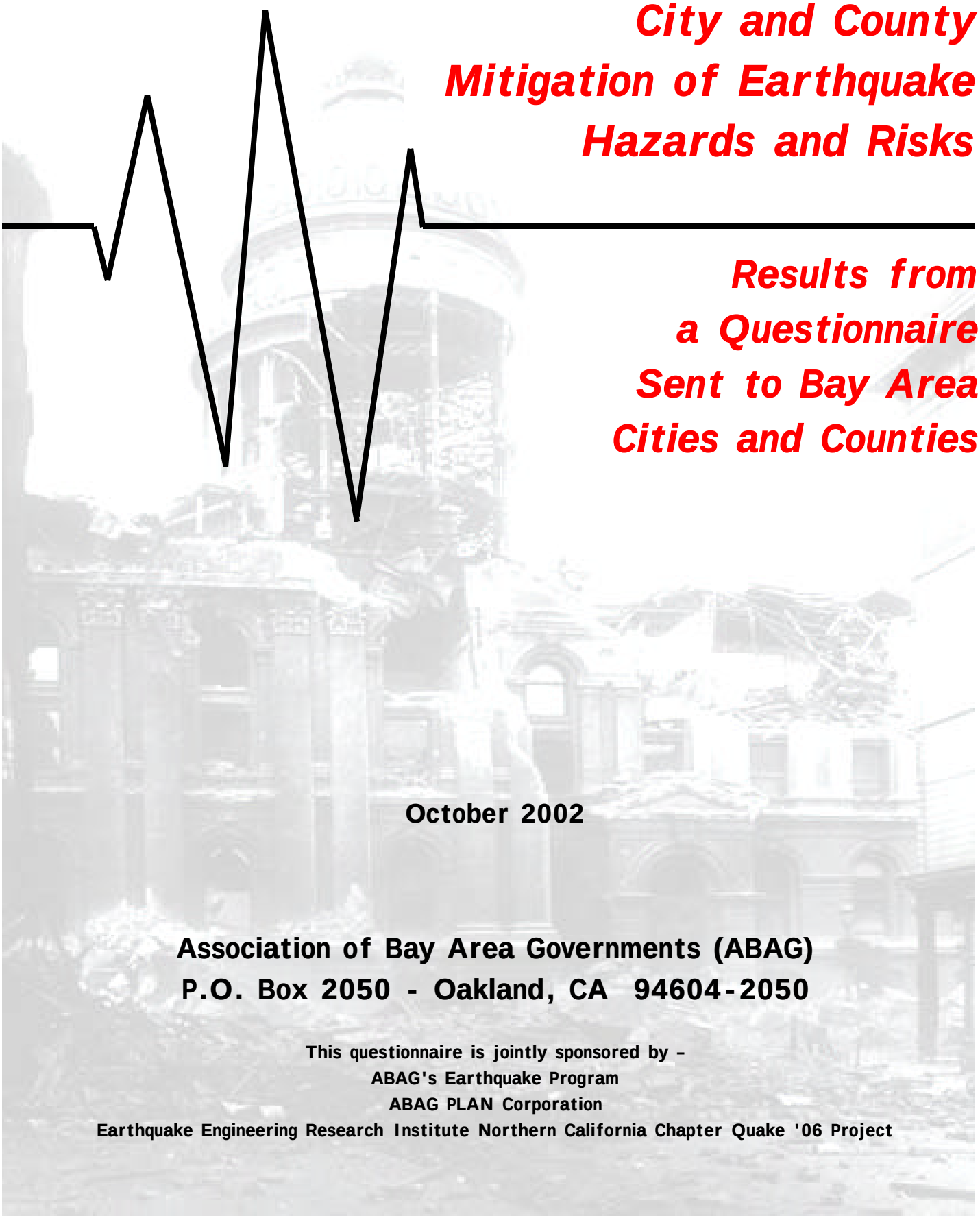

City and County Mitigation of Earthquake Hazards and Risks

Results from a Questionnaire Sent to Bay Area Cities and Counties

October 2002

Association of Bay Area Governments (ABAG)
P.O. Box 2050 - Oakland, CA 94604-2050

This questionnaire is jointly sponsored by –
ABAG's Earthquake Program
ABAG PLAN Corporation
Earthquake Engineering Research Institute Northern California Chapter Quake '06 Project

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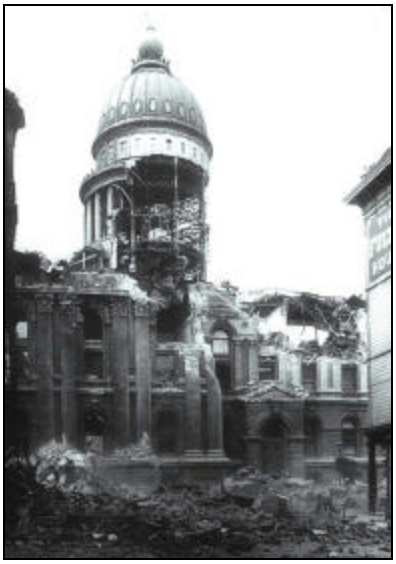
Acknowledgements:

ABAG wishes to thank the volunteers from the EERI Northern California Chapter Quake '06 Project Government Subcommittee for their assistance in the design of the questionnaire and in contacting survey participants to ensure a high response rate. In addition, ABAG staff Michael Smith and Joanna Bullock assisted in survey mailings and follow-up contacts.



San Francisco City Hall after the 1906 San Francisco earthquake

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Funding for the writing and production of this report, along with the questionnaires analyzed, came from the ABAG PLAN Corporation, with additional support from the Association of Bay Area Governments and the Earthquake Engineering Research Institute Northern California Chapter Quake '06 Project. Any opinions, findings, conclusions or recommendations expressed in this material are those of the author and do not necessarily reflect the views of ABAG, ABAG PLAN Corporation or EERI Quake '06.

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For information on ABAG PLAN Corporation, see our Internet site at *http://www.abag.ca.gov/plan/*.
For information on EERI Quake '06, see its Internet site at *http://www.quake06.org/*.

ABAG Publication Number: P02002EQK

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BACKGROUND AND INTRODUCTION

April 2002 marked the 96th anniversary of the 1906 San Francisco earthquake. ABAG's Earthquake Program has been working with a number of other organizations, including the ABAG PLAN Corporation, the Earthquake Engineering Research Institute (EERI) – Northern California Chapter Quake '06 Project, the California Office of Emergency Services, and the American Red Cross Bay Area, to push for a measurable improvement in the safety of the buildings and facilities in the Bay Area by April 2006.

Past ABAG research shows that local governments can be leaders in promoting the safety and preparedness of Bay Area residents by improving the safety of their own city and county buildings and other facilities, as well as in promoting efforts by owners of private buildings through financial and other incentives. In order to "track" progress, ABAG mailed a six-page questionnaire to the city manager or county administrator of each of the 109 cities and counties in the Bay Area. These officials were requested to fill out the questionnaire to provide ABAG with information on the various policies and programs that their jurisdiction had instituted to improve the safety of each of their cities and counties. ABAG was particularly interested in documenting the work that these local governments had accomplished since the 1989 Loma Prieta earthquake, as well as what was currently planned to be completed by 2006. The information obtained from these questionnaires is provided in this report.

SUMMARY OF QUESTIONNAIRE RESULTS

General Hazards and Risk Issues – Local government staff responding to this questionnaire indicated that the level of public awareness of earthquake hazards and risk in their jurisdiction is "moderately high." Similarly, they viewed the priority for seismic safety within their own local government as "moderately high" and the risk of a damaging earthquake affecting their jurisdiction as "moderately high." Significantly, however, many viewed the risk of a damaging earthquake as greater than the priority of seismic safety within their local government or than the level of public awareness of earthquake hazards. ***These observations point to a need to improve general earthquake risk information provided to the public. This information may also serve to help the public make better decisions when managing earthquake risk.***

Facilities and Buildings Owned and Leased by Cities and Counties – Responses to this questionnaire show that many local governments have undertaken a number of mitigation programs related to identifying vulnerabilities of their own buildings and facilities.

- 87% have an inventory of these facilities that includes location.
- 69% have evaluated the structural vulnerability of some or all of their facilities.
- 63% have evaluated the location of some or all of these facilities relative to various earthquake hazards.
- 54% have evaluated the vulnerability of building contents in some or all of their facilities.

In addition, 55% (46 local governments) have abandoned, retrofitted, or replaced at least one of their own facilities due to identified earthquake risk. A total of 175 projects were identified by 46

jurisdictions (some of which involved multiple buildings). ***Most significantly, for the 95 projects where dates of completion were provided, 95% were upgraded since the 1989 Loma Prieta earthquake and 56% in the last five years, including nine where retrofit is ongoing.*** The most common sources of funding for these projects included general funds, state and federal grants, and general obligation bonds. San Francisco has been a leader, with approximately 70 total public buildings strengthened, including its City Hall.

Staff of local governments who had not conducted these types of evaluations of their own facilities tended to view the level of public awareness of earthquake hazards, the priority of seismic safety within their own jurisdiction, and the risk of an earthquake damaging their jurisdiction as slightly lower than the average respondent. On the other hand, staff of local governments responsible for managing sewer or water pipelines yet doing less to "harden" those pipelines viewed public awareness and earthquake risk in their jurisdiction as slightly higher than average, pointing to a potential for more effectively managing earthquake risk of pipelines.

Privately-Owned Facilities and Buildings – In addition to the State-mandated inventory of privately-owned unreinforced masonry buildings, 40% of these local governments have conducted an inventory of at least one other type of potentially hazardous private building. 67% of the local governments have adopted one or more retrofit standards. 31% offer some type of financial incentive to private owners to retrofit. ***These responses indicate that an inventory of hazardous private buildings is not necessary for adoption of voluntary retrofit standards or for provision of financial incentives.*** Programs related to privately-owned buildings reflect the diversity of hazards and concerns of local governments. ***Reviews of these diverse programs should show opportunities for local governments to learn from each other in creating innovative and effective programs to manage earthquake risk in these buildings.*** For example, many cities are concerned about "soft-story" buildings where apartments are built on top of a parking garage or commercial space that may collapse in a strong earthquake, a problem in San Francisco's Marina District in the 1989 quake, as well as in the 1994 Northridge earthquake. The cities in Santa Clara County have joined with the county to create maps showing the areas with high densities of these buildings for use by emergency response personnel. San Jose has developed a guidebook to encourage apartment owners to retrofit. San Leandro has a preliminary inventory of suspected soft-story buildings and is working on a "validation form" for building owners that will discuss ways to get their buildings taken of the list. Fremont's efforts have focused on developing a model standard for retrofitting these buildings. Berkeley has been investigating ways to develop a package of financial technical, and educational materials to encourage retrofitting. City staff are developing an outreach campaign intended to develop a team approach among building owners, tenants, and the technical structural engineering community to encourage retrofitting of these buildings and have placed a measure on the November 2002 ballot to provide funding for this new earthquake safety program.

Recovery of Operations of City or County Government – Based on the responses to this questionnaire, 31% of the jurisdictions have not only a written plan to resume operations, but also plans ***that had been tested*** for emergency communications, protection of data and recovery of records, emergency power in their buildings, and emergency power related to transportation, such as for traffic

lights or fuel pumps for emergency vehicles. The most commonly tested components were emergency power in buildings and emergency communications. ***Although no data were collected as part of this survey on recent improvements in these programs, separate information points to strong improvements as a result of planning for Y2K and the State's power crisis.***

Programs Related to New Development – Only 23% of those responding indicated that their jurisdiction has instituted earthquake planning policies and practices in ***all*** of eight key areas:

- Geologic or soils studies for new construction;
- Geotechnical engineering studies for new construction;
- Outside peer review for these geologic or engineering studies;
- Disclosure requirements about seismic hazards;
- Land use or zoning restrictions;
- Reconstruction or redevelopment plans;
- Procedures for reviewing proposed new developments; and
- The Safety, including Seismic Safety, Element of the jurisdiction's General Plan.

One reason that relatively few responded that they have all of these programs may be the lack of communication among and within various city departments, rather than the lack of such a program. Another reason may be that some policies are of limited use, such as disclosure requirements in cities without State-mapped fault, liquefaction, or landslide study areas.

Motivations for Earthquake Preparedness and Mitigation - Those responding indicated that the principal ***motivators*** that would cause their local government to do more to reduce earthquake vulnerability were:

- Need to maintain local government functions after an earthquake;
- Action required by state or federal government; and
- Desire to avoid economic loss or loss of tax base.

Those factors most frequently cited as pivotal ***obstacles*** to their local government doing more to reduce earthquake vulnerability included:

- It would cost too much;
- We don't have the time; and
- We don't have the ability to get funds required to do the work.

While the listing of cost as an obstacle is not surprising, it is interesting that among respondents from local governments that had not undertaken costly structural retrofitting or replacement of their own facilities, "time" was listed as the most significant obstacle.

METHODOLOGY AND RESPONSE RATES

Questionnaires were sent out to the city managers and county administrators of the 109 cities and counties in the San Francisco Bay Area on April 4, 2002. Questionnaire participants were asked to return the questionnaire by April 25th. On May 2nd, a postcard was mailed to those jurisdictions that had not returned their questionnaire. On May 13th, a second questionnaire was mailed to those that had

not yet returned their questionnaire. Finally, on May 16th, phone calls were started to again remind participants to return their questionnaires. ABAG staff made calls to ABAG PLAN Corporation members, while volunteers from the Earthquake Engineering Research Institute (EERI) called the remaining jurisdictions.

As of July 17, 2002, 87 questionnaires (80%) had been returned. This percentage is very high for a questionnaire of this type and may be due, in part, to the extensive phone calling, as well as to the interest in the questionnaire results expressed by participating city and county staff.

Response rates were also broad-based by sub-region, but lower in the four North Bay counties.

- 69% of the questionnaires from jurisdictions in the North Bay counties of Marin, Sonoma, Napa, and Solano were returned (25/36).
- 89% of the questionnaires from jurisdictions in the East Bay counties of Contra Costa and Alameda were returned (31/35).
- 82% of the questionnaires from jurisdictions in the South Bay/Peninsula counties of Santa Clara, San Mateo and San Francisco were returned (31/38).

Response rates were similar for ABAG PLAN members (78% - 20/27) and for other cities and counties (80% - 66/82). This is significant because the questionnaire was not identical for these two subgroups. ABAG PLAN is doing a separate project to inventory and do an initial risk assessment of buildings owned by ABAG PLAN members. Thus, two initial questions related to building inventory (Q 5.a) and locational risk (Q 6) were eliminated and the follow-up questions changed because ABAG staff already had this information. In addition, ABAG PLAN provided these cities with a list of their buildings to assist in their response to Q 10. There was some concern on the part of ABAG staff that this printout would be a deterrent to responding.

There also was no significant difference in the response rate for counties (78% - 7/9) than for cities (80% - 81/101). (San Francisco is both a city and a county.)

On the other hand, the response rate for larger jurisdictions was slightly higher than for smaller ones.

- 86% (24/28) for those with a population greater than 75,000;
- 85% (22/26) for those less than 75,000 but greater than 33,000;
- 79% (22/28) for those less than 33,000 but greater than 12,000; and
- 70% (19/27) for those less than 12,000.

PART I - GENERAL HAZARDS AND RISK ISSUES

1. How would you describe the level of ***public*** awareness of earthquake hazards and risks in your jurisdiction? **Check ONE.**

❑ Very High ❑ Moderately High ❑ Moderately Low ❑ Very Low ❑ No Awareness At All

Over half of those responding said that the level of public awareness of earthquake hazards and risks in their jurisdiction is "moderately high" (58%, or 49/85), while 16% (14/85) indicated a "very high" level of public awareness and 26% (22/85) indicated a lower level.

2. As a policy issue within your own local government, what priority would you rate seismic safety? **Check ONE.**

❑ Extremely High Priority ❑ Moderately High Priority ❑ Moderately Low Priority ❑ Extremely Low Priority

Similarly, over half of those responding said that, as a policy issue within their own local government, the priority of seismic safety is "moderately high" (61%, or 51/84), while 20% (17/84) indicated an "extremely high" priority and 19% (16/84) indicated a lower level.

3. In what year did the last damaging earthquake that affected ***your*** jurisdiction occur?

If never, check here ❑, and go to question 4.

Year: _____

Almost three-quarters of the jurisdictions (74%, or 60/81) listed 1989 as the last damaging earthquake to affect their jurisdiction. However, 13 others listed "never," 1 listed 1900s (*Suisun City*), 3 said 1906 (*Clayton, Portola Valley, and Sausalito*), 1 listed 1969 (*Santa Rosa*), 1 listed 1980 (*Livermore*), and 2 listed 2000 (*Napa and Napa County*).

4. What do you believe is the risk of a major Bay Area earthquake affecting the residents, businesses, government functioning, or infrastructure of ***your*** jurisdiction? **Check ONE.**

❑ Very High ❑ Moderately High ❑ Moderately Low ❑ Very Low

Almost half of those responding said that the risk of a major Bay Area earthquake affecting their jurisdiction is "moderately high" (48%, or 41/85), a response similar to that for Questions 1 and 2. 39% (33/85) indicated a "very high" risk and only 12% (10/85) indicated a lower level.

Significantly, 45% of the responses (38/85) indicated that the risk of a major quake (Q 4) was greater than the public awareness of earthquake hazards (Q 1). In addition, 36% (30/84) indicated that the risk of a major quake (Q 4) was greater than the priority of seismic safety within their jurisdiction (Q 2). ***These observations point to a need to improve general earthquake risk information provided to the public. This information may also serve to increase the priority of seismic safety within local governments.*** A major exception was for those 14 cities that indicated their city had never experienced a damaging earthquake. In these cases, most (12/14) believed that the risk of a major quake (Q 4) was less than or equal to the priority of seismic safety (Q 2).

PART II - FACILITIES AND BUILDINGS OWNED OR LEASED BY YOUR CITY OR COUNTY

[Both the questionnaire and the cover letter suggested that the public works director or risk manager answer these questions.]

5. a. Approximately how many buildings and structures do you own? **Check ONE. Count EACH building and structure (including temporary trailers) separately. For example, a water treatment facility will have several buildings and a park may have several restroom structures.**

❑ 1-25 ❑ 26-50 ❑ 51-75 ❑ 76-100 ❑ More than 100

b. Approximately how many buildings and structures do you lease? **Check ONE. Again, count EACH building and structure separately.**

❑ None ❑ 1-5 ❑ 6-25 ❑ 26-50 ❑ More than 50

Almost three-fifths of those responding (50/86) indicated that their jurisdiction owned 50 or fewer buildings. Only 10% of those responding (9/86) indicated that their jurisdiction owned more than 100 buildings. Four of these nine were counties.

Local governments lease far fewer buildings than they own. Over one-third of those responding (32/84) indicated that their jurisdiction did not lease ANY buildings. Only 8% of those responding (7/84) indicated that their jurisdiction leased more than 25 buildings. Five of these seven were counties.

6. Have you compiled an inventory of these owned and leased buildings and structures that includes the location of each facility? **Check ONE.**

❑ Yes
❑ No, but we plan to have one by April 2003.
❑ No, but we plan to have one by April 2006.
❑ No. We currently have no plans to develop an inventory.

Most local governments have an inventory of these owned and leased buildings and structures that includes location (87% - 75/86). Of the 11 local governments that currently do not have an inventory, many (5/11) will have one by the end of 2003.

Respondents from those 11 jurisdictions without this inventory at the present time tended to describe the public awareness of earthquake hazards (Q 1), the priority of seismic safety (Q 2), and the risk of an earthquake (Q 4) as slightly lower than the average respondent.

7. Have you evaluated the location of these buildings and structures relative to their exposure to various earthquake hazards such as ground shaking or ground failure (including liquefaction and landslides)? **Check ONE and, if needed, reply to the appropriate follow-up question.**

- ❑ Yes, for all owned and leased buildings and structures.
- ❑ Yes, but only some of the buildings and structures.
- ❑ No, but we plan to do so by April 2003.
- ❑ No, but we plan to do so by April 2006.
- ❑ No. We currently have no plans to evaluate the hazard exposure of our facilities.

While 63% (54/86) of the cities and counties responding had evaluated the location of some or all of their facilities relative to various earthquake hazards, 75% of the ABAG PLAN members had done so. This effort on their part was ***in addition*** to the work currently being conducted by ABAG Earthquake Program staff for ABAG PLAN Corporation.

How did you select which facilities to evaluate? **Check ALL that apply.**

- ❑ Only facilities appraised at more than a pre-determined amount
- ❑ Age or type of construction (masonry, tilt-up concrete, wood, steel, etc.)
- ❑ High occupancy facilities
- ❑ Facilities critical in emergency response (such as an Emergency Operations Center)
- ❑ Facilities critical for government operations
- ❑ Other _____

For those jurisdictions limiting their evaluations, the most popular criterion was to look at facilities critical for emergency response (21/34). However, only slightly fewer jurisdictions used age or type of construction (17/34), high occupancy facilities (16/34) and facilities critical for government operations (18/34). Only two jurisdictions indicated that they used appraised value as one of the criteria. Those jurisdictions noting other criteria (7/34) described evaluating buildings in historic districts, buildings selected by the risk manager, buildings as they undergo significant repairs or remodeling, and critical medical facilities.

Respondents from those 32 jurisdictions who had not yet evaluated the location of any of their facilities tended to describe the public awareness of earthquake hazards (Q 1), the priority of seismic safety (Q 2), and the risk of an earthquake (Q 4) as slightly lower than the average respondent.

8. Have you assessed the structural vulnerability of these buildings and structures? **Check ONE and, if needed, reply to the appropriate follow-up question.**

- ❑ Yes, for all owned and leased buildings and structures.
- ❑ Yes, but only some of the buildings and structures.
- ❑ No, but we plan to do so by April 2003.
- ❑ No, but we plan to do so by April 2006.
- ❑ No. We currently have no plans to evaluate the structural vulnerability of our facilities.

Slightly more local governments had evaluated the structural vulnerability of some or all of their facilities than had looked at their location versus various earthquake hazards (69% - 59/85). However, only 65% of the ABAG PLAN members had done so. On the other hand, 23% (20/86) of local governments had evaluated the location of ALL of their buildings, while only 18% (15/85) of local governments had performed a structural evaluation on all of their buildings.

How did you select which facilities to evaluate? **Check ALL that apply.**

- ❑ Only facilities appraised at more than a pre-determined amount
- ❑ Age or type of construction (masonry, tilt-up concrete, wood, steel, etc.)
- ❑ High occupancy facilities
- ❑ Facilities critical in emergency response (such as an Emergency Operations Center)
- ❑ Facilities critical for government operations
- ❑ Other _____

For those jurisdictions limiting their evaluations, the most popular criterion was to look at facilities critical for emergency response (23/44). However, only slightly fewer jurisdictions used age or type of construction (21/44), high occupancy facilities (21/44) and facilities critical for government operations (19/44). Only one jurisdiction indicated that they used appraised value as one of the criteria. Those jurisdictions noting other criteria (12/44) again described evaluating buildings in historic districts, buildings selected by the risk manager, buildings as they undergo significant repairs or remodeling, critical medical facilities, or buildings damaged in past earthquakes. They also listed bond-funding requirements, studies prior to acquisition, and buildings with high public use as other criteria for limiting evaluations.

Respondents from those 26 jurisdictions without structural evaluations of any of their facilities tended to describe the public awareness of earthquake hazards (Q 1), the priority of seismic safety (Q 2), and the risk of an earthquake (Q 4) as slightly lower than the average respondent.

9. Have you assessed the vulnerability of the contents of these facilities to shaking damage? **Check ONE and, if needed, reply to the appropriate follow-up question.**

- ❑ Yes, for all owned and leased buildings and structures.
- ❑ Yes, but only some of the buildings and structures.
- ❑ No, but we plan to do so by April 2003.
- ❑ No, but we plan to do so by April 2006.
- ❑ No. We currently have no plans to evaluate the vulnerability of the contents of our facilities.

Fewer local governments had evaluated the vulnerability of building contents in some or all of their facilities than had looked at their location versus various earthquake hazards or had performed a structural evaluation (54% - 46/85). There was no significant difference in the response of the ABAG PLAN members (53% - 10/19). 22% (19/85) of local governments had evaluated the contents of ALL of their buildings, a percentage similar to that for examination of building locations.

How did you select which facilities to evaluate? **Check ALL that apply.**

- ❑ Only facilities appraised at more than a pre-determined amount
- ❑ Age or type of construction (masonry, tilt-up concrete, wood, steel, etc.)
- ❑ High occupancy facilities
- ❑ Facilities critical in emergency response (such as an Emergency Operations Center)
- ❑ Facilities critical for government operations
- ❑ Other _____

For those jurisdictions limiting their evaluations, the most popular criterion was to look at facilities critical for emergency response (18/27), while slightly fewer jurisdictions chose to look at facilities critical for government operations (16/27). Significantly fewer jurisdictions used age or type of construction (6/27) and high occupancy facilities (9/27). No jurisdictions indicated that they used appraised value as one of the criteria. Those jurisdictions noting other criteria (5/27) described evaluating building contents based on seismic review, risk management, health and safety (including critical medical facilities), and as part of building maintenance.

Respondents from those 39 jurisdictions without evaluations of the vulnerability of the contents of any of their facilities did not tend to describe the public awareness of earthquake hazards (Q 1), the priority of seismic safety (Q 2), and the risk of an earthquake (Q 4) as significantly different from the average respondent.

10. Has your city or county abandoned or retrofitted any buildings or structures as a result of an identified earthquake risk? (If you do not have extensive records, please concentrate on structures retrofitted or replaced since the 1989 Loma Prieta earthquake.) **Check ONE and, if needed, reply to the appropriate follow-up question.**

- ❑ Yes, we have abandoned, replaced, or retrofitted the following buildings owned or leased by the city or county due to identified earthquake risk - **Attach additional list, if necessary.**
- ❑ No, but we plan to do so by April 2003.
- ❑ No, but we plan to do so by April 2006.
- ❑ No. We currently have no plans to retrofit or replace any of our facilities.

55% (46 local governments) have abandoned, retrofitted, or replaced at least one of their own facilities due to identified earthquake risk. A total of 175 projects were identified by 46 jurisdictions (some of which involved multiple buildings). ***Most significantly, for the 95 projects where dates of completion were provided, 95% were upgraded since the 1989 Loma Prieta earthquake and 56% in the last five years, including nine where retrofit is ongoing.*** The most common sources of funding for these projects included general funds, state and federal grants, and general obligation bonds. San Francisco has been a leader, with approximately 70 total public buildings strengthened, including its City Hall. An additional 6% (5/84) planned to retrofit or replace at least one building by April 2003, while 7% (6/84) planned to do so by April 2004.

Respondents from those 38 jurisdictions that had not retrofitted or replaced any of their own facilities tended to describe the public awareness of earthquake hazards (Q 1), the priority of seismic safety (Q 2) as roughly the same as the average respondent. However, they tended to describe the risk of an earthquake affecting their jurisdiction (Q 4) as slightly lower than the average respondent.

For these buildings or facilities, how did you fund the retrofit or replacement?
Check ALL that apply.

❑ General Obligation Bond	❑ General Fund	❑ Federal Grant (such as FEMA)
❑ Certificate of Participation	❑ Assessment District	❑ State Grant
❑ Lease Revenue Bond	❑ Parcel Tax	❑ Other _____

91% (42/46) of those who had replaced or retrofitted buildings provided information on the funding source(s) used. The general fund was the most popular source of funding, used by 34 of the cities and counties. Certificates of participation had been used by 12 cities or counties, general obligation bonds by 7 jurisdictions, federal grant funds by 9, and state grant funds by 6. Only one jurisdiction had used a lease revenue bond, while none had used assessment districts or parcel taxes. However, 11 jurisdictions had used other sources of funding, including: capital improvement plan funds (San Jose and Foster City), Park District Hotel Tax (San Mateo), agency bond funds (Emeryville), community development agency funds (Sonoma), enterprise funds (Concord and San Leandro), redevelopment agency funds (Pittsburg, Morgan Hill, and Alameda County), sewer/water funds (Foster City), and private contributions (San Francisco).

11. Is your city or county responsible for sewer pipelines? **Check ONE, and, if needed, reply to the follow-up questions.**

❑ Yes ❑ No

63% of the cities and counties responding to our questionnaire indicated that they were responsible for the sewer lines in their jurisdiction (54/86).

a. Have you mapped these pipelines? **Check ONE.**

❑ Yes, in a GIS ❑ Yes, but not in a GIS ❑ No

41% of the cities and counties responsible for sewers indicated that they have sewer lines mapped in a GIS (22/54), while only 7% (4/54) indicated that they did not have maps of these lines.

b. In what decade were the majority of these pipelines installed? _____**(i.e., 1950s)**

The most common decade for pipelines to have been installed was the 1950s (by 14 of the 36 jurisdictions providing a specific decade), while 5 jurisdictions listed an earlier decade and 18 jurisdictions listed a more recent decade. None listed a decade earlier than the 1920s or later than the 1980s.

c. What criteria does your jurisdiction use to determine a replacement schedule for pipelines? **Check ALL that apply.**

❑ Age of pipeline

❑ Type of pipeline construction material

❑ Pipeline size

❑ Pipelines in areas subject to high ground shaking or ground failure hazards (such as liquefaction or landsliding)

❑ Other _____

The most popular criteria for replacing these pipelines are age (used by 35 jurisdictions), type of construction material (used by 25), and pipeline size (used by 17). Pipelines in areas subject to high ground shaking or ground failure hazards were only given preferential replacement by 6 jurisdictions. 30 jurisdictions listed other criteria for replacement, the most common being condition (often assessed with video equipment), actual failures, and maintenance or repair history.

d. Have you installed specially engineered pipelines in areas subject to faulting, liquefaction, landsliding, or other earthquake hazard? **Check ONE.**

❑ Yes ❑ No

26% of the cities and counties responsible for sewer pipelines (14/54) indicated that they have installed specially engineered pipelines in areas subject to faulting, liquefaction, or other earthquake hazards. Those 31 jurisdictions without specially engineered sewer pipelines tended to describe the awareness of earthquake hazards (Q 1) and the level of earthquake risk in their jurisdictions (Q 4) as higher than average, pointing to an opportunity for encouraging more mitigation and risk management.

12. Is your city or county responsible for water pipelines? **Check ONE, and, if needed, reply to the follow-up questions.**

❑ Yes ❑ No

44% of the cities and counties responding to our questionnaire indicated that they were responsible for the water lines in their jurisdiction (38/86), significantly fewer than the 63% were responsible for sewer lines.

a. Have you mapped these pipelines? **Check ONE.**

❑ Yes, in a GIS ❑ Yes, but not in a GIS ❑ No

39% of the cities and counties responsible for water pipelines indicated that they have these pipelines mapped in a GIS (15/38), while only 8% (3/38) indicated that they did not have maps of these lines. These percentages are virtually the same as for mapping of sewer lines.

b. In what decade were the majority of these pipelines installed? _____**(i.e., 1950s)**

The most common decade for pipelines to have been installed was the 1960s (by 7 of the 18 jurisdictions providing a specific decade), while 5 jurisdictions listed an earlier decade and 6 jurisdictions listed a more recent decade. None listed a decade earlier than the 1930s or later than the 1980s.

c. What criteria does your jurisdiction use to determine a replacement schedule for pipelines? **Check ALL that apply.**

❑ Age of pipeline

❑ Type of pipeline construction material

❑ Pipeline size

❑ Pipelines in areas subject to high ground shaking or ground failure hazards (such as liquefaction or landsliding)

❑ Other _____

The most popular criteria for replacing these pipelines are age (used by 28 jurisdictions), type of construction material (used by 24), and pipeline size (used by 20). Pipelines in areas subject to high ground shaking or ground failure hazards were only given preferential replacement by 3 jurisdictions. 17 jurisdictions listed other criteria for replacement, the most common being condition, actual failures, and maintenance or repair history.

d. Have you installed specially engineered pipelines in areas subject to faulting, liquefaction, landsliding, or other earthquake hazard? **Check ONE.**

❑ Yes ❑ No

21% of the cities and counties responsible for water pipelines (8/38) indicated that they have installed specially engineered pipelines in areas subject to faulting, liquefaction, or other earthquake hazards. Those 24 jurisdictions without specially engineered water pipelines tended to describe the awareness of earthquake hazards (Q 1) and the level of earthquake risk in their jurisdictions (Q 4) as higher than average, pointing to an opportunity for encouraging more mitigation and risk management.

13. Is your city or county responsible for either of the following types of facilities? **Check ALL that apply. Also, please make sure that information on these facilities is included in your responses to questions 5 - 10.)**
    - ❑ Yes, Wastewater Treatment Plant
    - ❑ Yes, Water Treatment Plant
    - ❑ No, neither

29% (24/84) of the cities and counties indicated that they were responsible for a wastewater treatment plant. Only 19% (16/84) of the cities and counties indicated that they were responsible for a water treatment plant.

PART III - PRIVATELY-OWNED FACILITIES AND BUILDINGS IN YOUR CITY OR COUNTY'S JURISDICTION

[Both the questionnaire and the cover letter suggested that the building official answer these questions.]

14. Does your jurisdiction have an inventory of privately-owned buildings with any of the following characteristics or features? **Check ALL that apply.**

- ❑ Unreinforced masonry buildings
- ❑ Non-ductile concrete buildings
- ❑ Multifamily residential buildings with parking on all or part of the ground floor (also called "soft-story" residential buildings)
- ❑ Tilt-up concrete buildings
- ❑ Hillside buildings
- ❑ Residential buildings that have had earthquake retrofit work such as cripple-wall bracing and foundation anchoring
- ❑ Other_____
- ❑ No, none at this time

URM Inventory - 56 jurisdictions of the 87 that responded stated that their jurisdiction had this inventory. Since State law requires such an inventory, the responses to this question point out the problem of treating the actual responses to a questionnaire such as this one as absolute fact. One of the reasons the responder in the other 32 jurisdictions did not indicate that the jurisdiction has an inventory may be that there are no URMs in their jurisdiction. The other reason may be that the person completing the questionnaire was not aware that a survey had been done. On the other hand, a jurisdiction may have an incomplete or "draft" inventory that is not a true "inventory" yet the person filling out this questionnaire may have checked that such an inventory exists. For example, in an earlier ABAG study to collect the addresses of residential URMs in the region, we determined that many cities removed URM buildings from their inventories when some retrofit work had occurred, even though the retrofit was for reducing the risks to life ***only*** and the building was still an unreinforced masonry building. In fact, all Bay Area jurisdictions have completed a URM inventory as required by State law, or have determined that they do not have any URMs. The official status of each jurisdiction is available at **www.seismic.ca.gov** (Report SSC 00-02).

Non-Ductile Concrete Inventory - 6 cities (no counties) - 1 in East Bay, 5 in North Bay (may be "Draft" or incomplete; no ABAG or EERI quality control of inventory assessment)
Fairfield, Martinez, Novato, Rio Vista, Sebastopol, and Suisun City

Multifamily Soft-Story Inventory - 12 cities (no counties) - 5 in East Bay, 5 in North Bay, 2 in South Bay/Peninsula (may be "Draft" or incomplete; no ABAG or EERI quality control of inventory assessment)
*Alameda, **Berkeley**, Brisbane, **Campbell**, Danville, **Fremont**, Larkspur, Mill Valley, Novato, Rohnert Park, **San Leandro**, and Tiburon*

Result of Follow-Up Phone Conversations with Selected Cities (cities contacted are shown in bold in the above list) -

City of Berkeley - The City's Disaster Resistant Berkeley Program received seed money from FEMA, and some additional funding from State OES, to examine the issue of soft-story multifamily residential buildings in the City. These buildings may be considered "soft-story" either because they have parking on the first floor or because they have commercial space on the first floor. The City has a ***preliminary*** list of approximately 400 such buildings containing 5,300 dwelling units. Senior structural engineers (volunteer EERI members) and UC Berkeley engineering graduate students participated in a "walkabout" sidewalk survey of the 150 soft-story buildings with the highest occupancy. These 150 buildings alone contain approximately 3,200 dwelling units. City staff and the City Council are working together to investigate ways to develop a package of financial, technical, and educational materials to encourage retrofitting. City staff are currently developing an outreach campaign intended to develop a team approach among building owners, tenants, and the technical structural engineering community to encourage retrofitting. Letters explaining this program, as well as informing building owners that their building is on the preliminary list of soft-story structures, will be mailed by the end of 2002. City staff and the City Council have placed a measure on the November 2002 ballot to provide funding for this new earthquake safety program. City staff have reviewed potential legal issues pertaining to this work with the City Attorney's Office. The City Council directed staff to conduct this building survey. (Source - personal communication, Arrieta Chakos, City Manager's Office - 7/8/02 and 9/2/02; Joan MacQuarrie, Building Official - 7/10/02)

City of Campbell - The City, as well as all of the other cities in Santa Clara County, contracted with the Collaborative for Disaster Mitigation (CDM) at San Jose State University to conduct a survey of soft-story apartment buildings and provide the City a map of densities of soft-story units. The inventory for Campbell has been completed. ABAG staff assume that the people filling out the questionnaire for the remaining cities in the County (as well for as the County itself) did not indicate that they had an inventory because the maps had not been completed in their area, or because they did not view the maps as a true "inventory." CDM is compiling a list of soft-story buildings that contains addresses of specific buildings. However, none of the cities have contracted with CDM to obtain the building addresses at this time. All of the work will be completed by September 2002. Apartment owners will be provided a copy of a guide prepared by San Jose. (Source - personal communications, Guna Selvaduray, Collaborative for Disaster Mitigation; Russ Patterson, City of Campbell Police Department - 7/9/02)

City of Fremont - The City's Building Department conducted an inventory of soft-story residential multifamily buildings in the City in late 1999. The City has approximately 22 of these buildings containing approximately 1,000 dwelling units. Three of these buildings contained from 150 - 250 dwelling units each, seven had from 25 - 75, and the remainder had 25. The City then adopted a voluntary retrofit ordinance and notified the owners of these buildings that their building had been identified as having a soft-story in late 1999 or early 2000. The owners were encouraged to retrofit. One of the buildings containing 7 or 8 units has been retrofitted to date. The retrofit standard contained in the Uniform Code of Building Conservation (UCBC), is based, in part, on the Fremont retrofit standard. The City was not concerned about potential lawsuits

from owners or occupants due to the jurisdiction's action or inaction involving this inventory. (Source - personal communication, Massoud Abolhoda, Building Official - 7/8/02)

City of San Leandro - The City's Building Department has conducted a ***preliminary*** "draft" inventory of soft-story buildings in the City. The inventory excludes single-family homes, but includes multifamily residential, commercial/office, and mixed use buildings. The inventory includes address, type, number of stories, number of residential units, number of office/commercial units, and assessors' parcel number. The City staff have met with the Apartment Owners Association, as well as the Chamber of Commerce. The list includes about 350 buildings, including about 4,000 residential and business units. During the summer of 2002, staff will develop a "validation form" that will be mailed to the building owners that will discuss ways to get their building taken off the list. City staff believe that many of the buildings are not actually soft-story buildings. The City was not concerned about potential lawsuits from owners or occupants due to the jurisdiction's action or inaction involving this inventory. (Source - personal communication, William Schock, Building Official - 7/2/02)

Tilt-Up Concrete Inventory - 17 cities (no counties) - 8 in East Bay, 5 in North Bay, 4 in South Bay/Peninsula (may be "Draft" or incomplete; no ABAG or EERI quality control of inventory assessment)
Alameda, Berkeley, Brisbane, Cupertino, Fairfield, Fremont, Hayward, Hercules, Larkspur, Morgan Hill, Newark (almost completed), Novato, Rohnert Park, San Leandro, San Ramon, Santa Clara, and Sebastopol

Hillside Buildings Inventory - 11 cities (no counties) - 1 in East Bay, 6 in North Bay, 4 in South Bay/Peninsula (may be "Draft" or incomplete; no ABAG or EERI quality control of inventory assessment)
Brisbane, Danville, Fairfield, Larkspur, Los Altos Hills, Mill Valley, Morgan Hill, Napa, Novato, Tiburon, and Woodside

Residential Buildings with Retrofit Work Inventory - 14 cities (no counties) - 6 in East Bay, 4 in North Bay, 4 in South Bay/Peninsula (may be "Draft" or incomplete; no ABAG or EERI quality control of inventory assessment)
Alameda, Danville, Fremont, Hercules, Hillsborough, Larkspur, Los Altos Hills, Mill Valley, Mountain View, Novato, Richmond, San Leandro, Santa Clara, and Tiburon

Other Building Inventories - 2 cities (no counties) (may be "Draft" or incomplete; no ABAG or EERI quality control of inventory assessment) -
Livermore - *Inventory of dwellings with unbraced cripple walls*
Palo Alto - *Pre-1936 buildings with occupant load>100* ***and*** *pre-1976 buildings with occupant load>300*

Overall, in addition to the State-mandated inventory of unreinforced masonry buildings, 40% (34/85) of these local governments have conducted an inventory of at least one other type of potentially hazardous private building.

15. Has your jurisdiction adopted seismic retrofit standards (such as the 1997 UCBC – Uniform Code for Building Conservation, **or** 2001 GSREB – Guidelines for Seismic Retrofit of Existing Buildings) for privately-owned buildings with any of the following characteristics or features? **Check ALL that apply. Please enclose copies of any ordinances, if you are willing to share them with other local governments.**

- ❑ Unreinforced masonry buildings
- ❑ Non-ductile concrete buildings
- ❑ Multifamily residential buildings with parking on all or part of the ground floor (also called "soft-story" residential buildings)
- ❑ Tilt-up concrete buildings
- ❑ Hillside buildings
- ❑ Residential retrofit standards for cripple-wall bracing and foundation anchoring
- ❑ Other_____
- ❑ No, none at this time

URM Retrofit Standard - A total of 49 cities and counties indicated that they had adopted a seismic retrofit standard for retrofit of unreinforced masonry (URM) buildings. Interestingly, 5 of these jurisdictions indicated that they had adopted a retrofit standard, but did not have an inventory. This apparent discrepancy may be because cities removed URM buildings from their inventories when some retrofit work had occurred, even though the retrofit was for reducing the risks to life ***only*** and the building was still a URM building. Thus, they may believe that they no longer have any URM buildings. All jurisdictions except San Francisco currently are required to use the State of California's minimum standard when retrofitting URM buildings, the 1998 ***California Building Standards Code***, ***Part 10***, the ***California Building Conservation Code***, which is ***Appendix Chapter 1*** of the ***Uniform Code for Building Conservation*** (UCBC). They may not have adopted triggers for its application, so the issuance of a building permit at the discretion of the owner may be the only trigger for some of these jurisdictions.

Non-Ductile Concrete Retrofit Standard - 6 cities (no counties) - 3 in East Bay, 2 in North Bay, 1 in South Bay/Peninsula (may be "Draft" or incomplete; no ABAG or EERI quality control). Note that only two of the six cities (shown in bold) indicated that they have an inventory of these buildings.
Campbell, Concord, Emeryville, ***Martinez, Rio Vista****, and Windsor*

Multifamily Soft-Story Retrofit Standard - 4 cities (no counties) - 2 in East Bay, 1 in North Bay, 1 in South Bay/Peninsula (may be "Draft" or incomplete; no ABAG or EERI quality control). Note that only one of the four cities (shown in bold) indicated that it has an inventory of these buildings.
Campbell*, Concord, Emeryville, and Rio Vista*

Tilt-Up Concrete Retrofit Standard - 11 cities and 1 county - 7 in East Bay, 3 in North Bay, 2 in South Bay/Peninsula (may be "Draft" or incomplete; no ABAG or EERI quality control). Note that only four of the jurisdictions (shown in bold) indicated that they have an inventory of these buildings.
*Campbell, Concord, Emeryville, **Fremont**, **Hayward**, **Hercules**, Palo Alto, Rio Vista, **San Leandro**, Sonoma, Windsor, and Contra Costa County.*

Hillside Buildings Inventory - 2 cities (no counties) - None in East Bay, 1 in North Bay, 1 in South Bay/Peninsula (may be "Draft" or incomplete; no ABAG or EERI quality control). Note that neither of these cities indicated that they have an inventory of these buildings.
Gilroy and Rio Vista

Residential Standards for Cripple Wall Bracing - 9 cities and 1 county - 5 in East Bay, 2 in North Bay, 3 in South Bay/Peninsula (may be "Draft" or incomplete; no ABAG or EERI quality control). Note that only four of the jurisdictions (shown in bold) indicated that they have an inventory of these buildings.
*Antioch, **Fremont**, **Hercules**, Los Gatos, Rio Vista, **San Leandro**, San Mateo, Santa Clara, **Tiburon**, and Contra Costa County*

Other Building Standards - 4 cities (no counties) (may be "Draft" or incomplete; no ABAG or EERI quality control)
Clayton - *Contracts with Contra Costa County and uses their standards*
San Jose - *UCBC Chapter 5*
San Leandro - *Standards will be adopted*
Sebastopol - *Council Policy 11-A*

Thus, the responses to this questionnaire indicate that a local government inventory of hazardous private buildings is not necessary for adoption of voluntary retrofit standards.

16. a. Does your jurisdiction offer any of the following as incentives to encourage retrofitting of privately-owned buildings? **Check ALL that apply.**

- ❑ Waivers of permit fees
- ❑ Reductions of permit fees
- ❑ Below-market loans
- ❑ Local tax breaks – please describe_____
- ❑ Grants to cover the cost of retrofitting
- ❑ Other_____
- ❑ No, none at this time

Permit Fees - Waivers - 10 cities (no counties) - 5 in East Bay, 3 in North Bay, 2 in South Bay/Peninsula (no ABAG or EERI quality control)
Albany, Berkeley, Fremont, Livermore, Los Gatos, Morgan Hill, Oakley, San Rafael, Sonoma, and St. Helena

Permit Fees - Reductions - 3 cities (no counties) - 2 in East Bay, 1 in North Bay (no ABAG or EERI quality control)
Pittsburg, San Leandro, and St. Helena

Below-Market Loans - 6 cities (including San Francisco) - 3 in East Bay, 3 in South Bay/Peninsula (no ABAG or EERI quality control)
Emeryville, Pinole, Redwood City, San Francisco, San Leandro, and Santa Clara

Local Tax Breaks - 2 cities (no counties) - 1 in East Bay, 1 in North Bay (no ABAG or EERI quality control)
Berkeley - *Property transfer tax rebate*
St. Helena - *Mills Act; Architectural/engineering fee rebates*

Grants to Cover the Costs of Retrofitting - 9 cities (no counties) - 4 in East Bay, 3 in North Bay, 2 in South Bay/Peninsula (no ABAG or EERI quality control)
Berkeley (for low income residents), *Brentwood, Colma, Emeryville, Morgan Hill, Napa, Pinole, St. Helena, and Windsor*

Other Incentives - 6 cities (no counties) - 1 in East Bay, 3 in North Bay, 2 in South Bay/Peninsula (no ABAG or EERI quality control)
Berkeley - *Deferred loans up to $15,000 for home strengthening*
Dixon - *$3/sq.ft. for URM retrofits*
Fremont - *Low interest loans in redevelopment area*
Napa - *Redevelopment incentive*
Palo Alto - *Owners are allowed to add 25% **or** 2500 sq. ft. if demolished or retrofitted*
San Mateo - *Commercial storefront improvement loans and grant funds*
Sonoma - *Grants for retrofit design*

b. Would your jurisdiction be interested in or want help or resources to implement such programs?

❑ Yes

❑ No, not at this time

In all, 40 local governments were interested in or wanted help or resources to implement programs such as these. ABAG and EERI staff plan to contact these jurisdictions to get additional information on the types of help they may most want.

17. Does your jurisdiction have a program similar to San Francisco's Building Operations Resumption Program (or BORP)? This program permits owners of private buildings to hire qualified structural engineers to create building-specific post-quake inspection plans and allows these engineers to become automatically deputized as City/County inspectors for these buildings in the event of an earthquake. **Check ONE.**

❑ Yes

❑ No, not at this time

After the 1989 Loma Prieta earthquake, private building owners experienced delays in having their buildings inspected for occupancy safety while San Francisco's Department of Building Inspection staff and mutual aid inspectors were engaged in inspection of collapsing structures, critical facilities, and City buildings. Some safe buildings were posted in error and others were evacuated awaiting inspection, causing business and tenancy interruption. San Francisco's Building Occupancy Resumption Program allows building owners to pre-certify private post-earthquake inspection of their buildings by qualified engineers upon building department acceptance of a written inspection program.

A total of 13 cities indicated that they have a program similar to San Francisco's BORP - 4 in East Bay, none in North Bay, and 9 in South Bay/Peninsula. Ten cities indicating they had a similar program were contacted by EERI volunteers to gather additional information. Three cities were not contacted (*Los Gatos, Morgan Hill, and San Ramon*). Two of the cities contacted had, in fact, no program of this type, but expressed interest in setting up such a program ***if the building department had control of the actual posting of the building*** (*Alameda and Portola Valley*). However, eight cities (including San Francisco) have instituted or are in the process of instituting a set of procedures. ***The procedures appear to have been instituted at the request major utilities and high-tech companies, accounting for the geographic distribution of the cities having such procedures.***

City and County of San Francisco - BORP was developed by a public/private partnership between the City & County of San Francisco Department of Building Inspection (DBI) and local chapters of the Building Owners and Managers Association (BOMA), Structural Engineers Association of Northern California (SEAONC), and the American Institute of Architects (AIA). Building owners - or tenants with the permission of owners - employ qualified engineers (having

design/inspection experience with buildings of similar size and complexity) to develop building-specific post-earthquake inspection plans. DBI staff and SEAONC volunteers review structural inspector qualifications and inspection plans. Upon approval, DBI gives building owner/structural inspectors official City placards with which to post the building following an earthquake and authorizes automatic deputizing of the structural inspectors upon declaration of a local emergency. Within 8 daylight hours of an earthquake, the inspectors are to respond and the inspection program is to be implemented, reporting results to DBI within 72 hours. In 2002, San Francisco has more than 50 buildings in the Building Occupancy Resumption Program; references are available for building owners participating in the program. A completed BORP building-specific inspection program is available for review from DBI. (Source - personal communication, Zan Turner, Building Official - 9/4/02)

City of Concord - The City's Building Department has been approached by six building owners with a BORP-like plan. The plans developed by these companies have been approved. Because some of the companies own multiple buildings, more than six buildings are currently enrolled in the program. (Source - personal communication, Vance Phillips, Building Official - 8/29/02)

City of Cupertino - The City's Building Department was approached by a company with a BORP-like plan approximately two years ago. The Building Official has approved the company plan. The Building Official wants to keep the option for the City to inspect the facilities if it is able to do so after an earthquake, but realizes that City staff may be too busy. The Building Official noted that he would probably accept the company's engineers' posting. (Source - personal communication, Greg Casteel, Building Official - 9/4/02)

City of Fremont - The City's Building Department started a program with the buildings of two companies. The new City Attorney has advised the Building Department that the City Council needs to approve the program. This has not yet occurred, so the program is now on hold. Meanwhile, another company has approached the City for plan approval. (Source - personal communication, Massoud Abolhoda, Building Official - 8/02)

City of Mountain View - The City's Building Department has a program with building owners, including many high-tech companies with large server farms. The program allows owners to hire engineers to develop building-specific post-earthquake inspection plans. Engineers then contact the City and send a draft of their plans to the Building Official for review. This review concentrates on the proposed interface with the City. After the plan is finalized the company sends a copy of it to the Building Official and he puts a copy of the plan in the City's Emergency Operations Center (EOC). After an earthquake, the engineers will call the Building Official with their reports and he will tell them whether or not they can occupy the buildings. He will also send a City inspector to post the building. (Source - personal communication, Ron Geary, Building Official - 8/02)

City of Palo Alto - The City's Building Department has six buildings in a BORP program. The BORP committee reviewed the inspection plans and sent letters to the City. The City also has letter agreements with a small number of other building owners who have contracted with engineers for post-earthquake inspections. The engineers will evaluate the buildings and report

their findings to the City. They City inspectors will then post the buildings. (Source - personal communication, Fred Herman, Building Official - 8/02)

City of San Jose - The City's Building Department has no formal program at this time. However, the City has agreed to allow building owners to contract with designers for post-earthquake inspections and send the information to the City for its files. After an earthquake, the engineers are to call San Jose to let the City know which buildings they are going to inspect. After the inspection, they are to report their findings to the City, after which the City sends its own inspectors to post the buildings. Approximately 4-5 buildings have current agreements. The Building Official is interested in expanding the program to be more like that of San Francisco. (Source - personal communication, Amal Sinha, Building Official - 8/02)

City of Santa Clara - The City's Building Department has no set policy, but a company can provide the City with an engineer's qualifications for review. If accepted, the engineer can inspect the buildings and recommend posting. However, the private engineer cannot affix the official placards. Two major companies have submitted plans. (Source - personal communication, Sheila Lee, Building Official - 8/02)

18. Does your jurisdiction have any mitigation programs for privately-owned buildings that you want to share? **Check ALL that apply.**

- ❑ Standard drawings
- ❑ Non-structural mitigation programs
- ❑ Tool lending library
- ❑ Other_____
- ❑ No, none at this time

Benicia, Fremont, Mill Valley, and San Leandro indicated that they would be willing to share standard drawings. San Leandro indicated that it would be willing to share its nonstructural hazard mitigation program. Berkeley, Gilroy, and San Leandro indicated that they would share information on their tool-lending library. Hercules and Marin County indicated a willingness to share their seismic gas shut-off valve safety program or ordinance. Fremont would be willing to share its retrofit standards for small apartments. Martinez indicated that it has videos to share. Pittsburg and San Francisco would be willing to share their URM ordinances. Berkeley is also interested in sharing information on its Rental Rehab Program. In this program, rental property owners may obtain deferred loans for property improvements, including earthquake strengthening.

PART IV - RECOVERY OF OPERATIONS OF CITY OR COUNTY GOVERNMENT

[Both the questionnaire and the cover letter suggested that the director of the emergency services office answer these questions.]

19. Does your jurisdiction have a written plan to resume its operations after a disaster?
❑ Yes ❑ No

87% (71/82) of the cities and counties responding to this question indicated that they had a written plan to resume operations after a disaster. The jurisdictions that indicated that they did not have such a plan included both large and small cities, as well as two counties.

20. Does your jurisdiction have a plan for emergency communications?
❑ Yes ❑ No
└ If yes, has it been tested? ❑ Yes ❑ No

98% (80/82) of the cities and counties responding to this question indicated that they had a plan for emergency communications. Of the two cities that indicated that their city did not have such a plan, one indicated that the plan was only for some disruptions of communications.

All 69 jurisdictions that answered the question about testing of this plan indicated that testing had occurred. However, the remaining 11 jurisdictions that indicated a plan existed did not answer this question, a relatively high non-response rate.

21. Does your jurisdiction have a plan for protection of data and recovery of records?
❑ Yes ❑ No
└ If yes, has it been tested? ❑ Yes ❑ No

86% (67/78) of the cities and counties responding to this question indicated that they had a plan for protection of data and recovery of records. Of the eight jurisdictions that indicated that they did not have such a plan, seven were small-to-medium sized cities and one was a county. Five of the 11 are in the North Bay, while the remaining three are located in the South Bay/Peninsula. An additional three cities (two in the East Bay and one in the South Bay/Peninsula) indicated that only some departments have a plan for only some data.

75% (41/55) of the jurisdictions that answered the question about testing of this plan indicated that testing had occurred. Again, however, the remaining 12 jurisdictions that indicated a plan existed did not answer this question, a relatively high non-response rate.

22. Does your jurisdiction have a plan for emergency power in your buildings?

❑ Yes ❑ No

└ If yes, has it been tested? ❑ Yes ❑ No

95% (78/82) of the cities and counties responding to this question indicated that they had a plan for emergency power in their buildings. The remaining three cities and one county indicated that the plan only covered the critical emergency facilities (such as the EOC).

All 74 of the jurisdictions answering the follow-up question on whether or not the plan had been tested indicated that it had been. Only four of the jurisdictions that indicated a plan existed did not answer this question. This rate is far lower than for the earlier questions in this section. This testing rate may be due, in part, to the Y2K preparedness efforts, as well as to the energy crisis in the summer of 2001.

23. Does your jurisdiction have a plan for emergency power related to transportation, such as for traffic lights, or for pumps needed for delivering fuel to emergency vehicles?

❑ Yes ❑ No

└ If yes, has it been tested? ❑ Yes ❑ No

69% (56/81) of the cities and counties responding to this question indicated that they had a plan for emergency power related to transportation, such as for traffic lights or fuel pumps. An additional five cities indicated that the plan only covered only fuel pumps, not traffic lights. Some of the cities that indicated that their jurisdiction had a plan might also have had a plan only for fuel pumps since the question is phrased with an "or," not an "and."

91% (49/54) of the jurisdictions answering the follow-up question on whether or not the plan had been tested indicated that it had been. Only two of the jurisdictions that indicated a plan existed did not answer this question. Again, this testing rate may be due, in part, to the Y2K preparedness efforts, as well as to the energy crisis in the summer of 2001.

PART V - PROGRAMS RELATED TO NEW DEVELOPMENT

[Both the questionnaire and the cover letter suggested that the planning director answer these questions.]

24. Listed below are examples of planning policies and practices that could be instituted by jurisdictions such as yours to deal with the danger of earthquakes. Please check all the ones that have been revised or instituted prior to the 1989 Loma Prieta earthquake in the first column, check all those that have been revised or instituted since the 1989 quake in the second column, and check all the ones that have been revised or instituted in the past five years in the third column. **Check ALL that apply.**

Earthquake Planning Policies and Practices	Revised or Instituted Prior to 1989 Quake	Revised or Instituted Since 1989 Quake	Revised or Instituted in Last Five Years
Geologic or soils studies for new construction	❑ pre-quake	❑ post-quake	❑ post-1996
Geotechnical engineering studies for new construction	❑ pre-quake	❑ post-quake	❑ post-1996
Outside peer review for geologic or engineering studies	❑ pre-quake	❑ post-quake	❑ post-1996
Disclosure requirements about seismic hazards	❑ pre-quake	❑ post-quake	❑ post-1996
Land use or zoning restrictions	❑ pre-quake	❑ post-quake	❑ post-1996
Reconstruction or redevelopment plans	❑ pre-quake	❑ post-quake	❑ post-1996
Procedures for reviewing proposed new developments	❑ pre-quake	❑ post-quake	❑ post-1996
Safety, including Seismic Safety, Element of General Plan	❑ pre-quake	❑ post-quake	❑ post-1996
Other program _____	❑ pre-quake	❑ post-quake	❑ post-1996

79 cities and counties replied to this question by checking at least one box. This response has been interpreted as 79 responses to the question, rather than that only 79 out of 87 total jurisdictions responding had at least one program and the remaining 8 had done nothing.

One of the problems with analyzing the responses to this question is that some jurisdictions interpreted the question as allowing them to check one or more boxes in a row and others seemed to believe that they could only check one box in each row. Thus, the summary of results described in this report looks at the overall responses to each policy (that is, each row), and to the most recent time period (that is, the last five years), rather than doing more specific evaluations of each box in this table.

Another problem with analyzing the responses to this question is that ABAG staff and EERI volunteers are aware of city and county programs that were not noted in the reply to this question. ***These discrepancies indicate the lack of communication among and within various city departments, as well as a general lack of institutional memory, on the part of some jurisdictions, rather than the actual lack of a program.***

A final problem with interpreting these responses is that several of the local programs or procedures may apply only to developments of a certain size or type. Thus, because a city did

not always require a particular procedure, and most of day-to-day projects are exempt, the respondent may have chosen not to indicate that this policy or practice exists.

94% (74/79) of the cities and counties had incorporated earthquake issues into requirements for geologic or soils studies for new construction. 29% (23/79) had revised or instituted these policies in the last five years.

90% (71/79) of the cities and counties had incorporated earthquake issues into requirements for geotechnical engineering studies for new construction. 27% (21/79) had revised or instituted these policies in the last five years.

63% (63/79) of the cities and counties had requirements for outside peer review of geologic or engineering studies that covered earthquake issues. Interestingly, one of the cities indicating that they had this requirement had indicated that they did not have a policy or practice related to either geologic or soils studies, or geotechnical engineering studies. Thus, this city's response to one or both of the previous questions is probably inaccurate. 37% (29/79) had revised or instituted these policies in the last five years.

44% (35/79) of the cities and counties had disclosure requirements for earthquake issues and geologic hazards. 13% (10/79) had revised or instituted these policies in the last five years.

68% (54/79) of the cities and counties had land use or zoning restrictions related to earthquake issues. 22% (17/79) had revised or instituted these policies in the last five years.

46% (36/79) of the cities and counties had incorporated earthquake policies or practices into their reconstruction or redevelopment plans. 16% (13/79) had revised or instituted these policies in the last five years.

67% (53/79) of the cities and counties had incorporated earthquake hazards issues into procedures for reviewing new developments. 23% (18/79) had revised or instituted these policies in the last five years.

82% (65/79) of the cities and counties had incorporated earthquake hazards issues into their Safety Element of their General Plan. Since State law requires such a policy, this response indicated that some people responding are not aware of the existing policies of the city. 28% (22/79) had revised or instituted these policies in the last five years.

Four jurisdictions (*Pacifica, Rohnert Park, Santa Rosa, and Santa Clara County*) indicated that they had additional planning policies or practices related to earthquake issues. Santa Rosa's program consists of a special inspector of the seismic load bearing system for new construction. Santa Clara County has adopted fault, liquefaction, and landslide hazard maps in addition to those mandated by the State and the UBC. Pacifica and Rohnert Park did not describe their additional programs.

Three cities had revised or instituted all eight types of programs listed in the last five years (*Brentwood, Oakley, and Rio Vista*). Oakley has only recently been incorporated as a city (in 1999), so this response is particularly appropriate for this jurisdiction.

PART VI - GENERAL QUESTIONS ON MOTIVATIONS FOR EARTHQUAKE PREPAREDNESS AND MITIGATION

25. What are the principal motivators that would cause your local government to do more to reduce earthquake vulnerability? **Check ALL that apply.**
    - ❑ A - Person on staff or local elected official acting as advocate
    - ❑ B - Action required by state or federal government
    - ❑ C - Concern for potential liability
    - ❑ D - Altruistic goal to improve public safety
    - ❑ E - Need to maintain local government functions after an earthquake
    - ❑ F - Desire to avoid economic loss or loss of tax base
    - ❑ G - Active risk management program
    - ❑ H - Desire to avoid personal injury or injury to fellow employees
    - ❑ I - Public image generated by acting, or not acting, responsibly and subsequent media coverage
    - ❑ J - Improve employee morale
    - ❑ K - Other _____

26. Of the possible motivations listed in Question 25, which do you feel are most pivotal in promoting more actions? _____ **List the letters of up to three.**

Three motivations were checked by at least two-thirds of those responding to this question - B - Action required by state or federal government (52/77);
E - Need to maintain local government functions after an earthquake (57/77); and
F - Desire to avoid economic loss or loss of tax base (52/77).

The need to maintain local government functions after an earthquake (E) was also the motivation provided most frequently as pivotal in promoting more actions, listed by 38 of the local government officials responding. ***This response indicates an opportunity to advocate for additional nonstructural mitigation because of its effectiveness in improving government operations and recovery.***

It is misleading, however, to believe that there are only a few motivators for action, for all but risk management (G), public image (I), and employee morale (J) were listed by at least 14 jurisdictions.

It is also misleading to believe that these are the responses that would be provided if key local officials were interviewed in person. For example, in previous ABAG studies of local government motivations for action, the critical role of a key person on staff or local elected official acting as an advocate (A) has been highlighted. In this mailed questionnaire, this motivator was listed by 44 jurisdictions, while only 14 viewed it as pivotal.

27. What are the principal reasons that your local government has not done more to reduce earthquake vulnerability? **Check ALL that apply.**

- ❑ A - We don't think earthquakes are much of a problem in our city/county.
- ❑ B - We don't have the time.
- ❑ C - It would cost too much.
- ❑ D - We don't know what we need to do.
- ❑ E - We don't have the ability to get funds required to do the work.
- ❑ F - We are concerned about identifying problems due to liability exposure.
- ❑ G - We haven't gotten around to it.
- ❑ H - It isn't a high enough priority.
- ❑ I - Other _____

28. Of the possible obstacles listed in Question 27, which do you feel are most pivotal in preventing more actions? _____ **List the letters of up to three.**

Three motivations were checked by at least two-fifths of those responding to this question - B - We don't have the time (35/76);
C - It would cost too much (36/76); and
E - We don't have the ability to get funds required to do the work (33/76).

These same three factors were also listed as the three most pivotal obstacles for more action, listed by 38% (25/65), 45% (29/65), and 38% (25/65) of the jurisdictions listing pivotal factors, respectively. All of these factors were listed as pivotal obstacles by at least three jurisdictions, however.

It is misleading to overestimate the role of money as an obstacle. For example, one of the most expensive actions that a local government can take is to retrofit or replace one of its own facilities. 38% of those responding listed "It would cost too much" as a pivotal obstacle, and an insignificantly different 37% of those from jurisdictions that had not retrofitted or replaced any buildings believed this was a pivotal factor. On the other hand, most of those from jurisdictions that had not retrofitted or replaced any buildings (59% - 16/29) listed "We don't have the time" as the most pivotal obstacle.

It is also misleading to view liability as a common obstacle. Staff of three local governments had indicated to ABAG staff prior to this questionnaire being mailed that they believed concern for liability was preventing the types of inventories of privately-owned buildings (see Q 14) from being conducted in their jurisdiction (other than the mandated inventories of unreinforced masonry buildings). Thus, it is interesting to note that among local governments responding to both Q 14 and this question, liability was listed as a pivotal obstacle by 2 of the 37 local governments without any inventories and a similar 1 of the 24 local governments with at least one inventory. Thus, based on the responses to this questionnaire, there is not evidence that liability is preventing a significant number of cities from conducting inventories of private buildings.

The fact that only 26% (20/76) of the respondents believed that earthquakes were not a high enough priority in their jurisdiction, and only 10 of these viewed this factor as a pivotal obstacle is significant, given the observation in Part I that 36% (30/84) indicated that the risk of a major quake (Question 4) was greater than the priority of seismic safety within their jurisdiction (Question 2).

29. Would you appreciate a presentation at a staff or Council or Supervisors meeting by an expert from EERI, USGS, ABAG, State Office of Emergency Services, or American Red Cross - Bay Area on earthquake hazards and ways to mitigate earthquake risks?

❑ Yes ❑ No

Almost half of those responding to this question (49%, or 34/69) indicated that they would appreciate a presentation at a meeting. ABAG and EERI staff plan to contact these jurisdictions to get additional information on the types of help they may most want.

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